

FISHERIES PROGRAM ANNUAL REPORTS

Rivers and Streams

By Fred Ryckman

Angler use of rivers and streams was greatly reduced during the drought of the late 1980s and early 1990s. Periodic statewide surveys showed angler use bottomed out in 1992-93, with the end of this drought period. By comparison, angler use of rivers and streams during the 1999-2000 fishing season (the last year for which data is available) was eight times higher than in 1992-93.

This tremendous increase in use is attributable in large part to much improved water and habitat conditions following the end of the drought in 1993. Fish populations responded quickly and favorably. The wet cycle of the mid-to-late 1990s showed that one of the keys to ensuring healthy fish populations in rivers and streams is simply to have ample flows – including both high flow periods and at least some level of “base flow” during even the driest parts of the year.

A high flow period tends to trigger extensive movements of fish – upstream and downstream from reservoirs and from mainstem to tributary waters. Such high flows and subsequent fish movements allow for dispersal of fish into areas from which were once eliminated – as a result of winter or summer kills, for instance. High spring flows generally trigger the greatest fish movements, since many of North Dakota’s native fish species have evolved to take advantage of these flows for spawning purposes.

A “minimum” or “base flow” during even the driest periods helps to ensure fish survival through these most stressful times. To ensure healthy sport and other fish populations in our rivers and streams, resource managers simply must do more to make sure that adequate river flows are attained.

In 2001 river flows varied considerably from east to west. Eastern North Dakota received above-normal precipitation and higher than normal river flows throughout much of the year. Except for the Little Missouri River, western North Dakota rivers generally experienced much lower than normal flows, especially after mid-summer.

Rivers and streams continue to support significant sport fishing and recreational use, despite the comparatively limited

amount of management attention which they receive. Since many “mid-sized reservoirs” are located on the state’s major rivers, sport fish stocking and management of these reservoirs often benefits sport fish populations many miles upstream and downstream.

Some of the better river fishing activity in 2001 was reported in the Red and James – catfish in the Red and several species in the lower James River, particularly walleye in fall and early winter.

Northern pike are perhaps the most widespread and abundant sport fish in North Dakota’s river systems, and support considerable angling activity. The best sites for fishing rivers is usually below impoundments, which tend to concentrate fish and often have good public access.

The increase in angling and other public use of rivers has stimulated an increase in the amount of funding various public entities have devoted to river issues and projects. As in previous years, the Red River continued to receive the most attention in 2001. In particular, modifying dams by placing rocks below existing concrete spillways has been a multi-agency priority. These new structures allow for better fish passage over the dams, and greatly reduce the hazards associated with public use of these areas.

Modification of the Riverside Dam in Grand Forks is complete, the North Dam in Fargo is in progress, and similar modifications to the South Dam in Fargo and Drayton Dam near Drayton are in the planning stages.

The Riverkeepers organization in Fargo has been working on canoe access sites on the Red in the Fargo area; similar canoe access work has been completed by the Barnes County Wildlife Federation on the Sheyenne River between Baldhill Dam and Valley City. Efforts to protect Grand Forks from future catastrophic flooding entail the construction of a “greenway” along the Red. Plans for this greenway include a number of beneficial features for the river and for public use of the river.

The Red River was also the focus of a larval fish project in 2001. Dr. Steve Kelsch of the University of North Dakota, and a graduate student completed field work, but data analysis and a final report



are not expected until later this year.

Dr. Kelsch and a research associate also continued to work on development of a rivers and streams fish data base in 2001. Phase I of this project included development of a fish species list for each river, as well as a range map for each North Dakota species. Phase II, currently in process, includes development of improved GIS mapping and layering capabilities as well



as a web site to allow for use of the database information by resource agency personnel as well as the public.

Resource and use conflicts continue to seriously affect the state's rivers and streams. Even though water withdrawals and diversions draw water from most rivers, water permit applications for even more withdrawals continue to be approved. By contrast, high flows on some

rivers in recent years have spurred additional channelization, bank stabilization and channel "cleanout." The predictable result of such projects is that more water runs off even faster to cause even more serious problems downstream.

FRED RYCKMAN, Williston, is a Game and Fish Department district fisheries biologist.

Boat ramps such as this one in Breckenridge, Minnesota provide anglers along the North Dakota-Minnesota border access to the Red River. The Red River is famous for the quality of its catfishing.

Small Lakes and Reservoirs

By Gene Van Eeckhout

Dry environmental conditions usually affect small lakes and reservoirs first. Conversely, these lakes also respond more quickly than larger water bodies during wet years.

Across the state, North Dakota is currently experiencing both extremes. It has been dry in the west. From the Montana border to middle of the state, water levels were low as winter 2001-02 set in. It has been wetter in the east. From the middle of the state to the Minnesota border, water levels ranged from near-normal in reservoirs to overflowing in natural lakes. In fact, tens of thousands of acres of new water currently exist in the eastern one-half of the state because of this uncharacteristic high in the water cycle. Many of these new and/or expanded water bodies have been placed under fisheries management.

Some new lakes have been colonized by upstream or downstream movement of fish and the Game and Fish Department has stocked some. Unfortunately, far too many anglers have also stocked fish illegally. The Governor's fishing proclamation clearly states that: "Stocking of any live fish, live fish eggs, live amphibians, or other live aquatic organisms into any waters of the state shall be illegal except with the appropriate license or permit issued by the game and fish director."

While this activity may appear harmless or humorous to those responsible, pernicious introductions often cause long-term, negative and irreversible consequences. For example, creation of a yellow perch fishery in a new lake (former marsh), in and of itself, is not disastrous. As water levels return to normal on the prairie, these fisheries will self-destruct, and the wetland will once again function as a marsh, providing habitat for a variety of prairie wildlife.

Problems occur when fish escape or are moved to other waters, where they cause management problems such as over-population. Individuals interested in stocking fish in a new lake should contact fisheries staff in their area.

Photo omitted

The moderately dry conditions and long winter of 2000-01 resulted in winterkill of approximately a dozen lakes in the west. Low water levels and a hot summer lead to three additional partial summerkills, these confined primarily to the extreme southwest. Fortunately, the rest of the State came through the winter and summer in good shape, with only small, isolated reports of fish mortality. Fishing has been good and without unforeseen problems this winter, summer 2002 should provide multiple opportunities.

The Save Our Lakes initiative is an exciting new fisheries program that shows great promise addressing chronic water quality and fish habitat problems that plague our small lakes and reservoirs. Projects range from aeration to watershed restoration, bank stabilization to live-stock exclosures, dredging to hypolimnetic syphon installation. Twenty-seven projects have been identified throughout the state. All but two of them involve small lakes and reservoirs. They were selected not only because of need, but because they are good demonstration areas.

Fishing use in recent years on Small Lakes/Reservoirs has increased dramatically (this is especially true for icefishing) and, as evidenced by the accompanying table, exceeds the long-term objectives. In fact, the objectives have been increased to reflect the greatly improved fishery we are now witnessing. Many fantastic fish-

ing opportunities now available in North Dakota would not be possible if not for the excellent cooperation of local landowners. The North Dakota Game and Fish Department has worked with many farmers in recent years, developing some type of public access agreement thus allowing unimpeded access to North Dakota's fishing lakes.

GENE VAN EECKHOUT, Jamestown, is a Game and Fish Department district fisheries biologist.

Small Lakes and Reservoirs

Year(s)	Anglers	Angler Days	# Caught	-GAME FISH- # Harvested	Population Index ^a
1985-89	50,216	331,425	ID	ID	415
1990-94	24,843	164,457	ID	ID	213
1995-99	39,848	588,040	ID	ID	428
2000-04	45,432	729,368	ID	ID	584
Objectives	35,000	350,000	1.4 million	1.1 million	300
^a Index of gamefish biomass. ID= Insufficient data.					

Mid-sized Reservoirs

By Emil Berard

Management objectives for North Dakota's 14 mid-sized reservoirs (see accompanying list) reflect renewed interest in these highly productive fisheries. Previous objectives were derived from historic information. This included an extended drought period which reduced angler use and fish productivity. Angler participation has since increased due to improved aquatic habitat and better fish populations.

The biological yardstick, Population Index, did not change because it represents an average of the peaks and valleys experienced long-term. This index is a measure of game-fish quality in a fishery. The value increases as reservoirs produce greater numbers of larger game fish. This ultimately translates into improved angler use and success. Standard adult (fish) population sampling in 2001 exceeded overall objectives for the sixth consecutive year, but results may be a signal that this productivity has peaked.

It's normal for reservoir productivity to fall following many years of stable or declining water levels. Conversely, productivity improves as rising water levels inundate new structure and habitats. The filling process produces strong fish year-classes which, in later years, will influence the population index as these fish grow to a desirable size. Index values will then fluctuate with the system's ability to produce forage to maintain growth, and the gamefish harvest rate.

Population index values peaked for eight individual reservoirs by 1998, and the average value for all mid-sized reservoirs peaked in 2000. Sampling results for 2001 show a decline in the population index value for six of the nine reservoirs surveyed. The index for five of these reservoirs declined below their long-term average (1985-2001).

On the other hand, Lake Audubon, LaMoure and Pipestem all exceeded their long-term average value.

Overall reservoir conditions have remained relatively stable for several years, making it more difficult to reach program objectives. Water quantity/volume has been adequate for all but the southwestern portion of the state, where near-drought conditions prevail. These wet/dry cycles are nature's way of establishing shoreline aquatic habitat and replenishing fish communities.



Heart Butte Dam (Lake Tschida), provides excellent facilities as well as good angling in both the tailrace below the dam and in the reservoir itself. It is one of the state's most popular mid-sized reservoirs.

Mid-Sized Lakes and Reservoirs

Year(s)	Anglers	Angler Days	# Caught	-GAME FISH- # Harvested	Population Index ^a
1985-89	22,272	354,438	1.9 million	1.8 million	315
1990-94	20,500	211,601	ID	ID	201
1995-99	26,605	256,383	ID	ID	334
2000-04	49,000	513,000	ID	ID	410
Objectives	40,000	400,000	407,000	259,000	325
^a Index of gamefish biomass. ID= Insufficient Data					

Several management options are also helping to improve fishing in mid-sized reservoirs. Examples include artificial habitat like tree reefs in Bowman-Haley or shoreline seeding at Pipestem, which provides new cover and spawning areas. Water level management is used on several reservoirs to reduce erosion, improve water quality, and increase habitat by revegetating shorelines. New forage species like gizzard shad in Bowman-Haley or cisco in Audubon increase a reservoir's ability to raise more and bigger fish. Spot eradication and rough fish removal projects help to reduce competition for food and space from undesirable fish populations. Brood fish stocking provides balance in game and forage populations as needed to improve overall sport fishery values.

Deteriorating water quality is the primary long-term challenge limiting sport fishery potential. Watershed diagnostic feasibility

studies have been completed for several reservoirs and are now planned for the upper Sheyenne River and Pipestem Reservoir. While these projects identify specific problems where "Best Management Practices" would help, they generally lack the teeth or funding needed to implement corrective measures.

Angler use on mid-sized reservoirs has increased as have the Department's efforts to maintain long-term fishery health.

EMIL BERARD, Dickinson, is the Department's western district fisheries supervisor.

North Dakota's Mid-sized Reservoirs

Heart Butte Reservoir	Lake Ilo
Lake Ashtabula	Arrowwood Lake
Jamestown Reservoir	Jim Lake
Pipestem Dam	Dickinson Reservoir
New Johns Lake	Nelson Lake
Bowman-Haley Reservoir	Lake LaMoure
Lake Darling	Lake Audubon

Devils Lake



The day before freeze-up at Minnewaukan Recreation Area on Devils Lake in November 2001.

By Randy Hiltner

Devils Lake water levels increased about two feet during the summer of 2001. The lake rise once again meant increased expense and maintenance for extending boat ramps and raising parking areas.

Devils Lake's four main game fish species, walleye, northern pike, yellow perch and white bass continue to provide excellent angling opportunities. Rising lake levels and corresponding habitat changes have changed the Devils Lake game fish population. Northern pike and yellow perch now comprise more of the total fish population by weight than they did in the early 1990s, whereas walleye and white bass comprise a relatively smaller proportion.

Objective levels for Devils Lake are obtained from netting surveys, angler questionnaire surveys and creel surveys.

The population index, the weight of game fish per hour the net is in the water, is obtained from Game and Fish Department netting surveys. Last summer's index was slightly higher than the objective level and approaching the weights netted in the early 1990s. This is significant as the lake has increased in size considerably since then.

Devils Lake						
-GAME FISH-						
Year(s)	Anglers ^a	Angler Days ^a	#Caught ^b	#Harvested ^b	Lbs. Harvested	Population Index
1985-89	30,000	No Data	No Data	No Data	No Data	No Data
1990-94	16,941	99,446	218,700	154,690	235,488	944
1995-99	17,501	247,136	894,898	507,599	455,634	616
2000-04	32,819	484,252	No data	No data	No data	844
Objectives	30,000	300,000	600,000	350,000	350,000	800
^a Derived from statewide angler questionnaire.						
^b Derived from creel surveys.						

Angler questionnaires provide information on the number of anglers and angler days at Devils Lake. The average number of anglers and angler days were both well above objective levels. Angler interest is relatively high when it comes to fishing North Dakota's largest natural lake.

A creel survey is currently being conducted at Devils Lake. When the survey is completed it will provide information on the number of game fish caught, harvested and pounds of game fish harvested for the 2000-2004 period. It is likely that the objective levels will be met.

Devils Lake currently offers a variety of game fish of various sizes for the angler. This variety and quality will continue to draw anglers from near and far. Devils Lake can be viewed as a long-term fishery that should continue to yield game fish on a sustained basis.

RANDY HILTNER, Devils Lake, is a Game and Fish Department district fisheries biologist.

Missouri River System

By Jeff Hendrickson

Elevation and flows on the Missouri River System were again low in 2001, creating some problems for fishing access. This was especially evident on Lake Oahe and upper Lake Sakakawea.

In spite of this, fishing success for the entire Missouri River System remains good, especially for walleye. Objectives for the Missouri River System have been

exceeded since 1995. The year 2000 was exceptional as objectives for sport fish catch and harvest were exceeded by 36 and 50 percent respectively.

Most anglers who fish the Missouri River/Lake Oahe section target walleye. Unfortunately, this fishery is still struggling through hard times due to forage (rainbow smelt) problems in Lake Oahe. The population continues to be dominated by walleye between 14 and 16 inches.

The bright spots on this section are pike fishing on Lake Oahe and salmon and trout fishing at the Garrison Dam Tailrace. Cutthroat trout are relatively new to the Tailrace and they have grown well since first stocked at one-third pound in May 1999. In 2001, brown and cutthroat trout of five-plus pounds were again common. A new state record was established for cutthroat trout at eight pounds, four ounces. Good salmon and trout angling should continue in 2002.

Walleye fishing was again good on Lake Sakakawea in 2001. Records were set for catch and harvest in 2000, when anglers harvested 496,000 walleye averaging 1.9 pounds. Similar success for walleye fishing continued in 2001. The walleye population remains strong and the future is promising.

Sauger populations have been relatively stable throughout the 1990s, as has the catch and harvest by anglers.

Northern pike and smallmouth bass populations are also in good shape and the future looks bright.

Chinook salmon fishing was good in 2001 and the egg take was excellent, producing more than enough eggs needed for stocking in 2002. The average size and number caught during spawning were similar to 2000, when anglers harvested 12,200 salmon averaging 8.2 pounds. More jacks (1 year old males) were in the spawning run in 2001, which usually is an indicator of future year class strength. Salmon fishing in recent years has been good and should continue in the near future.

The paddlefish population in the upper Missouri and Yellowstone rivers remains stable. Paddlefishing was good in 2001 and our harvest still exceeds our acceptable quota. Because of this, anglers will only be able to purchase one paddlefish tag in 2002.

Fishing on the Missouri River System ultimately depends on water levels. We are currently experiencing lower than normal water levels. If this trend continues, it will affect the coldwater fishery (primarily rainbow smelt), which ultimately determines the quality and quantity of game fish populations. We need lots of snow in the mountains above the Missouri and Yellowstone rivers, and the sooner the better!

JEFF HENDRICKSON, Riverdale, is the Department's central district fisheries supervisor.

Missouri River System

Year(s)	Anglers ^a	Angler Days ^a	-GAME FISH ^b			Population Index ^c
			# Caught	# Harvested	Lbs. Harvested	
1980-84	54,200	No Data	No Data	No Data	No Data	518
1985-89	51,500	—	431,000	375,000	933,000	429
1990-94	42,300	479,700	911,185	559,400	652,300	471
1995-99	57,000	843,000	1,196,000	565,000	1,410,000	673
2000-04	60,000	692,500	1,357,000	748,000	1,275,000	646
Objectives	50,000	500,000	1,000,000	500,000	1,000,000	500

^aDerived from statewide angler questionnaire.

^bDerived from creel surveys.

^cIndex of gamefish biomass.

Photo omitted